

Airport Master Plan

Duluth International Airport

Prepared for Duluth Airport Authority

5 Landside, Zoning, Environmental and Airport Property Facility Recommendations and Alternatives Analysis

This section identifies landside, terminal, land use and zoning, environmental and support facilities needed to satisfy the 20-year forecast of aviation demand at the Duluth International Airport (DLH). Airport facilities are developed in accordance with FAA airport design standards and airspace criteria. The following is an outline of facilities documented in this section:

- Landside Facilities including the Commercial Service Terminal
- Solid waste and sustainability recommendations
- Land use and aviation safety zoning recommendations
- Airport Property and easement recommendations

This study intends to develop realistic recommendations for the planning period. The planning period of this study covers through 2040. Whether the recommendations for the future development will be implemented depends on the actual demand, ability of the Airport to accommodate the development, environmental impacts and available financial and other resources of the local, state and federal decision-makers to meet that demand.

Frequent and rapid changes can occur in the aviation industry as well as increased frequency of regulatory changes within the FAA. It is equally important that an ongoing process of evaluation for existing conditions and near-term trends be implemented to assure the validity of the contents and recommendations of this Master Plan.

Below is the list of recommendations included as part of this chapter. Additional information on the recommendations can be found in the section highlighted below.

- Terminal Building Recommendations
 - A custom gutter system should be installed along the canopy system to eliminate the drip line, increase drainage, and improve customer experience (**Section 5.2.1**)
 - The Airport reconfigure the seating configuration to accommodate the passenger demand (**Section 5.2.2**)
 - The airport should plan for the recommended maintenance actions included in the assessment. With appropriate maintenance, the PBB may likely last beyond the baseline useful life. Replacement should be planned for after they reach beyond 20 years and maintenance is no longer cost effective and/or parts become hard to locate (**Section 5.2.3**)
- Terminal Vehicle Parking Recommendations
 - It is recommended that the airport evaluate the typical length of visit of vehicles and evaluate the parking capacity needs as enplanements reach 200,000 (**Section 5.3.3**)

- Replacement of the parking management system technology is included in the CIP in the first 5-years of the planning term. The following recommendations should be considered for inclusion as part of that project (**Section 5.3.4**)
- It is recommended that short-term parking areas have higher daily rates than long-term lots to discourage long-term parking (**Section 5.3.4**)
- As demand increase for the cell phone lot, an expansion could accommodate approximately two spaces to the east and four spaces to the to the west to accommodate additional vehicles (**Section 5.3.5**)
- While the existing traffic levels and customer base at DLH may not be sufficient to support a valet parking operation, it is a service that could be considered seasonally when the parking ramp and lots are at higher capacity and when winter weather makes walking to and from a car less desirable (**Section 5.3.5**)
- The airport should consider the value of dedicated parking spaces for travelers with small children (See **Section 5.3.5**)
- A Level 2 Electric Vehicle charger should be installed at the airport in a paid parking lot. (**Section 5.3.4**)
- The airport should consider the installation of needed technology to provide parking space availability to customers for both the parking garage and surface lot when the parking management system and technology is next replaced or upgraded. (**Section 5.3.4**)
- The airport should consider the installation of needed technology to provide parking space availability to customers for both the parking garage and surface lot when the parking management system and technology is next replaced or upgraded (**Section 5.3.4**)
- The airport should consider a transition to a cashierless exit lane when the parking management system and technology is next replaced or upgraded. (**Section 5.3.4**)
- The airport should install a varied rate system for the two parking products (garage and paved surface lot) when the parking management system and technology is next replaced or upgraded. Additionally, if the airport were to implement a varied rate system, branding of parking options should also be implemented (**Section 5.3.4**)
- It is recommended the airport upgrade the terminal roadway and surface lot lighting to LED. The Airport should coordinate with Minnesota Power to determine if there are available rebate programs. (**Section 5.3.6**)
- It is recommended that a Siting and Feasibility Analysis study be conducted prior to designing a QTA facility. This study is recommended to be completed in 2023 with the design and construction of a QTA to follow in 2024, pending availability of funding. (**Section 5.3.8**)
- Ground Transportation Recommendations
 - It is recommended that a TNC shelter and designated pickup location with appropriate wayfinding be constructed in the commercial vehicle lane. (**Section 5.4.1**)
 - The airport should continue to work with DTA to ensure bus schedules best meet the needs of employees and passengers using bus services to travel to/from DLH. Additionally, the airport should work with tenants and stakeholders to evaluate the need for bus service to other areas of the airport. (**Section 5.4.2**)
 - The Airport should continue to monitor these State sponsored pilot programs as well as MnDOT's Connected and Automated Vehicle Office (CAV-X) for project updates. Additionally, the Airport should coordinate with the City of Duluth and the Metropolitan Interstate Council (MIC) when they begin to plan for and implement autonomous vehicles into City and Regional transportation planning. (**Section 5.4.2**)

- It is recommended the Airport review the ACRP report once it is published to identify ways to prepare for and identify opportunities of UAM. (**Section 5.4.3**)
- Snow Removal Equipment (SRE) and Maintenance Equipment Recommendations
 - The SRE vehicles should be replaced based on the vehicle replacement plan and available funding (**Section 5.5**)
 - SRE Building maintenance projects include replacing sealant at exterior precast concrete wall panel joints, replacing sealant joints between the butt jointed sections of glass at the curtain wall system, cleaning and repainting of exterior hollow-metal doors and frames and servicing the sectional 4-fold garage bay service doors and their operable components (**Section 5.5** and **Appendix C**)
 - It is recommended that the airport construct a heated sand and chemical storage building to house the airside chemicals and to relocate the sand storage out of the existing SRE building (See **Section 5.5.1**)
- Part 139: ARFF Recommendations
 - It is recommended that an emergency vehicle access road be constructed to provide access to Runway 9/27 and Runway 3/21 and the radius of the turns should be able to allow for ARFF vehicles to safely make the turn at a higher rate of speed. (See **Section 5.6**)
- Aviation Support Facility Recommendations
 - It is recommended that DLH, in coordination with the FBO, continue to monitor the FAA's and EPA's progress for updated regulations and replacements for AvGas, such as the 100LL currently sold at DLH (See **Section 5.7.1**)
 - It is recommended the airport continues to monitor wildlife in and around the airport and install wildlife skirting in areas where wildlife frequently dig under the fence. (**Section 5.7.3**)
 - The Airport should share their 2016 Airport Landscape Plan with developers to ensure the landscapes are compatible with aviation safety and the airport should continue to update the Landscape Plan as needed. (**Section 5.7.4**)
- Roadway Access Recommendations
 - No landside access improvements are needed; however, it is recommended that the airport play an active stakeholder role in future MIC short- and long-term planning efforts. (**Section 5.13**)
- Environmental and Sustainability Recommendations
 - The airport should promote the use of multiple use beverage containers for water, coffee, etc. inside the terminal building and with airport employees (**Section 5.14.1**)
 - It is recommended the airport continue the use of electronic media by using electronic mail, website notifications, etc. for tenants, employees, and airport board packets. (**Section 5.14.1**)
 - It is also recommended that the Airport utilize WLSSD resources to identify potential re-use or proper disposal of site materials and IT equipment. Options should be explored to reduce solid waste generation through logistical changes, purchasing policies, or recycling efforts for any unique waste materials generated routinely or as part of special construction projects. (**Section 5.14.1**)
 - It is also recommended that waste management practices be evaluated annually and discussed with the WLSSD Administrator to determine if the waste reduction efforts are adequate, if there have been any regulatory changes, and whether any modifications are necessary. (**Section 5.14.1**)

- It is recommended the Airport obtain and display WLSSD and/or MPCA brochures to promote proper waste management activities and share these practices with airport tenants (**Section 5.14.2**)
- It is also recommended that the Airport establish site-specific airport waste abatement goals and prepare signage or notifications for airport users to assist the facility in meeting the goals. (**Section 5.14.2**)
- It is recommended the Airport provide easy access, recycling bins on-site for basic recyclable material (newspaper, cardboard, cans, glass, and plastic) in order to promote recycling in areas with highest waste generation (like the Terminal building) and have signage indicating which materials go into which bin (**Section 5.14.3**)
- It is also recommended to provide a centralized indoor storage area for the storage of problem materials, particularly those banned from land disposal including fluorescent lamps, electronics, appliances, HHW, used motor oil and motor oil filters, tires, lead acid, nickel-cadmium, and vehicle batteries. (**Section 5.14.3**)
- It is also recommended the Airport assign duties to airport personnel to monitor recycling bins and the problem material storage area and make arrangements, as necessary, to transport materials to appropriate recycling and/or drop-off locations (**Section 5.14.3**)
- It is recommended that a Spill Prevention, Control and Countermeasure (SPCC) be in place for all tanks on the airport to maintain the site's compliance with 40 CFR Parts 110 through 112 (**Section 5.14.4**)

5.1 Minnesota SASP Requirements and Recommendations

As previously discussed in **Section 2.2.2**, Phase I of the 2020 Update to the *Minnesota State Aviation System Plan* (SASP) classifies DLH as a Key Commercial Service Airport. **Table 4-1** includes the minimum objectives (measures) for a Key Commercial Service Airport and any recommended improvements for DLH. Recommendations from the SASP will be discussed in related sections that follow.

5.2 Commercial Service Terminal

The airport terminal is the link between the community and the Airport and is often a visitor's first and last impression of the community and region. The existing Terminal Building is located on the southeastern edge of the Airport with landside road access to Haines Road and Airport Road. The Terminal Building is a three-story, 130,000 square foot building with four passenger boarding bridges, several ticket counters, two baggage claims, security screening, TSA office and airport staff offices and conference room located on the third floor. There are several other offices located through the first and second floors of the terminal. Additional information about the terminal and its' facilities can be found in **Section 2.14.1**.

5.2.1 Terminal Building Condition

The terminal building was evaluated as part of the Building Condition Assessments completed as part of the Master Plan (see **Appendix C**). Following completion of the assessment, the terminal roof was replaced in fall 2021. The general condition as rated a 5 on a scale of 0-5 with 0 being poor condition. The assessment recommended continuing with the building maintenance schedule for building components and utilities per the original building O&M manual.

The vehicle drop-off lane is covered by a canopy, and the outer edge of the canopy is positioned over the driver door of a vehicle parked at the curbside. Currently, water drips off the canopy onto the driver side of cars parked at the curbside. Although the original design intended for water to flow away from the outer edge and into roof drains, the drainage is not working as intended and not all water is flowing towards the roof

drains. **A custom gutter system should be installed along the canopy system to eliminate the drip line, increase drainage, and improve customer experience.** This project should be completed in the near-term.

The building was built just before LED lighting systems became economically feasible. Advances in LED technology and cost reductions since then have made LED lighting the system of choice in most applications. Utility companies provide rebates for LED lighting retrofits and other energy saving measures. An investigation into what programs and rebates are available for energy savings is recommended.

Many of the systems in the terminal building may reach the end of their useful life in the 10-20year term. The airport should plan for replacement of building, mechanical and electrical systems as they reach the end of their useful life and continued maintenance is no longer cost effective. Because increased costs are anticipated for the terminal building after year 10, the miscellaneous building maintenance line item in the CIP should be increased from \$100,000 to \$150,000 annually starting at year 10 and increased to \$175,000 in year 15.

5.2.2 Terminal Building Sizing and Secure Area Recommendations

As discussed in **Chapter 3**, passenger enplanements are forecasted to reach 177,720 in the 20-year forecast period (2038). The following recommendations focus on opportunities to improve gate hold capacity as additional airline service is added with the potential that leisure destination flights could be at gates at the same time, along with the other two gates also being in use. **It is recommended that the airport reconfigure the seating configuration to accommodate the passenger demand.** The recommendations include a revised seating configurations and cueing areas.

- Existing gate hold capacity: 391 seats
- Potential proposed redistribution of furniture/gates: 476 seats (151 additional seats)

Appendix K summarizes various gate hold capacity scenarios with 100% load factor, 80% load factors and 75% load factors. If 100% is achieved through the forecast period (2038) a terminal expansion may be required to continue to accommodate the 100% load factors.

The Master Plan forecasts assume average 75%-85% load factors (depending on aircraft/airline and year of forecast). Based on these assumptions, there should be sufficient space to accommodate four flights (example includes 2 737-800, EMB-175 and CRJ-900) departing at similar times. However, if load factors of this fleet mix were all consistently 100%, there may be a need for a terminal expansion. Comparatively, 100% load factors of a Delta/United type fleet mix (EMB-175, CRJ-700, A-319/320 and CRJ-900) departing at similar times is fully accommodated with the redistributed furniture layout.

Appendix K includes additional information and methodology on the secured area recommendations and terminal building sizing.

5.2.3 Passenger Boarding Bridges

As part of this Master Plan, Ameribridge assessed the four passenger boarding bridges (PBB) (See **Appendix D**) The assessment recommends routine maintenance to ensure the maximum useful life possible. AIP funding is not eligible for PBB's until they reach the end of their useful life, or 20 years. **The airport should plan for the recommended maintenance actions included in the assessment. With appropriate maintenance, the PBB may likely last beyond the baseline useful life. Replacement should be planned for after they reach beyond 20 years and maintenance is no longer cost effective and/or parts become hard to locate.**

Table 5-1 summarizes the maintenance costs recommended in the PBB Assessment. Ameribridge estimated that a new PBB would cost approximately \$542,000 in 2021 dollars.

Table 5-1 – Passenger Boarding Bridge Maintenance Recommendations

Gate #	Manufacturer	Manufacture Date	Estimate Costs of Recommended Repairs
1	Thyssenkrupp	December 2012	\$60,960
2	Thyssenkrupp	December 2004	\$54,060
3	Thyssenkrupp	October 2009	\$43,093
4	Thyssenkrupp	October 2009	\$62,382

Notes: Cost of repairs are in 2021 dollars

Source: AmeriBridge Passenger Boarding Bridge Assessment

No additional improvements to the Terminal Building are recommended.

5.3 Terminal Vehicle Parking

There are several parking lots that surround the terminal building. Directly south of the terminal building is the parking garage and the surface lot, both offering hourly and daily parking at an equal rate. The three-story parking garage includes heated parking space for rental car pick-up and corporate (premium) parking and unheated hourly/daily parking. The heated corporate parking is sold on an annual basis and provides a dedicated heated parking space to the lessee. The parking garage is connected to the terminal by a heated skyway. There are several other lots that surround the terminal including the rental car return lot, TNC pickup spots, and permit/employee parking.

Table 5-2 summarizes the existing parking facilities and their use, capacity and condition.

Table 5-2 – Vehicle Parking Facilities

Parking Facility	Use	Parking Capacity	Pavement Condition
Parking Garage	Premium parking spaces	215	Not assessed in Pavement Assessment. However, continual pavement maintenance is recommended
	Corporate parking (heated)	47	
	DAA Maintenance Parking (heated)	3	
	Rental Car Parking (heated)	101	
Economy Surface Lot	Short- & Long-Term Parking	800	Very Good – Ongoing preventative maintenance recommended
West Surface Lot	Rental Car Return TNC Pickup DAA Staff Parking	250	Excellent – Ongoing preventative maintenance recommended
East Surface Lot	Corporate and Permit Parking	150	Very Good – Ongoing preventative maintenance recommended

Source: DAA, Landside Pavement Assessment (2020)

5.3.2 Pavement Condition

The pavement condition of the various terminal parking lots ranges from very good to excellent. Ongoing preventative maintenance (crack seal) is recommended every other year, or at least every 3 years (see Landside Pavement Assessment report for additional details). If adequate ongoing pavement maintenance is

used over the next 5-10 years, a more substantial rehabilitation or reconstruction project may not be needed in the next 15 years. Pavement rehabilitation or reconstruction is likely to be needed in the next 15-20 years.

5.3.3 Parking Space Needs

ACRP Report 25, *Airport Passenger Terminal Planning and Design*, provides general guidance for vehicle parking at airports. The report recommends 900 to 1,400 parking space per million enplaned passengers. Additionally, employee parking should range from 250 to 400 spaces per million enplanements. These are general planning guidelines, and the numbers should be adjusted based off airport specific data.

The commercial passenger activity forecasts (see **Section 3.5**) included three different scenarios for forecasted passenger enplanements. **Table 5-3** outlines these scenarios with the recommended parking space for passengers and employees through the end of the planning period the more conservative number was used to plan for long term parking needs. Additionally, with a low-cost carrier in the market, Canadian travelers may travel to DLH and choose to fly out of the Airport due to the cheaper flights and leisure travelers have different parking habits.

Table 5-3 – Parking Space Demand

Enplanement Forecast	2023	2028	2038	Recommended passenger parking 2038 Forecast*	Recommended employee parking 2038 Forecast*
Baseline Enplanements	145,000	152,710	177,720	286	82
Baseline + Alternative 1	159,906	170,138	195,148	314	90
Baseline + Alternative 2	155,150	167,936	192,946	311	89
Baseline + Both Alternatives	177,562	194,980	219,990	354	101
Existing passenger (economy and premium parking): 1,015 spaces					
*Additional 15% added to recommended number to account for seasonal peak activity					

Based on usage information provided by the Airport and evaluation of the forecast parking demand, no parking facility expansions are recommended. **Figure 5-1** depicts the traffic flow to the parking ramp and surface lots and available parking spaces.

The short-term lots generally utilize higher hourly rates to discourage long-term vehicles from parking to close-in facilities. ACRP Report 24, *Guidebook for Evaluating Airport Parking Strategies and Support Facilities*, estimates that customers parking for over 24 hours typically account for less than 30% of all entering and exiting vehicles, but they occupy more than 70% of all parking spaces and generate most of the parking revenue at an airport. In this planning period the aviation activity forecast approaches the 200,000-enplanement planning threshold. ***It is recommended that the airport evaluate the typical length of visit of vehicles and evaluate the parking capacity needs as enplanements reach 200,000.***

5.3.4 Parking Products and Technology Recommendations

Recommended parking and related technology strategies can be categorized into the following categories: duration-based parking products, value-added parking products, complementary customer services, parking space availability and guidance systems, cashierless transactions and revenue enhancement strategies. ACRP Report 24, *Guidebook for Evaluating Airport Parking Strategies and Support Facilities* was used as the primary basis for the recommendations in this section.

The existing parking management system is owned by DAA. The parking management company operates it and makes maintenance recommendations. Currently, Amano conducts maintenance. The existing parking

management agreement is nearing the end of its term (within the 5-year period) and DAA wishes to evaluate other options to improve parking revenues and the customer experience. **Replacement of the parking management system technology is included in the CIP in the first 5-years of the planning term. The following recommendations should be considered for inclusion as part of that project.**

5.3.4.1 Parking Products – Duration Based Parking Products

Short-Term and Daily/Long-Term Parking – At Duluth, all paid parking is the same pay structure and there is no separate lots or spaces dedicated to short-term parking customers. Short-term parking is typically those that park 4 hours or less. ACRP Report 24, Guidebook for Evaluating Airport Parking Strategies and Support Facilities, estimates that customers parking for over 24 hours typically account for less than 30% of all entering and exiting vehicles, but they occupy more than 70% of all parking spaces and generate most of the parking revenue at an airport.

The purpose of a designated short-term parking area is to minimize congestion along the terminal curbside and ensuring available parking spaces for these customers. Designated and convenient short-term parking locations can help minimize congestion on the terminal curbside. When short-term parking is not provided, the most convenient spaces tend to be utilized by long-term parking customers causing difficulties for short-term parking customers to find convenient spaces. When parking spaces are hard to find, or a long walk from the terminal, customers are more likely to utilize the curbside (potentially in combination with the cell phone waiting lot) instead of paying to park when picking up or dropping off passengers. This is especially true in climates such as Duluth where long walks to the terminal to pick up friends and family are less desirable in winter months. Short-term lots with dedicated convenient parking spaces may lead to more parking revenue as those who may otherwise use the curbside may opt to park in a fee lot, if convenient. **It is recommended that short-term parking areas have higher daily rates than long-term lots to discourage long-term parking.** To implement a separate short-term parking area, a separate entrance lane and parking ticket kiosk is required; however, the same exit lane as other fee structure areas.

FAA Advisory Circular 150/5360-13, *Planning and Design Guidelines for Airport Terminal Facilities*, recommends that separate short-term and long-term parking be provided when annual passenger volume exceeds 200,000. In this planning period the aviation activity forecast approaches the 200,000-enplanement planning threshold. Implementation of a short-term parking area is not recommended in the near-term, but **it is recommended that the airport evaluate the typical length of visit of vehicles and evaluate the parking product needs as enplanements reach 200,000.**

Free 30 Minute Parking – At airports where there is curbside congestion, free 30-minute parking can help alleviate the congestion by allowing customers to park for free for a brief period of time. Often, this free parking is offered in a short-term parking lot. ACRP Report #24 noted several challenges that airports who have instituted free parking have reported, including: customers dissatisfied that the 30-minutes was not sufficient to walk to and from the parking area and conduct their activities in the terminal and return to exit the lot, customers complaining they were unable to exit in the time period because of delays at the exit lane, and complaints and confusion that the grace period should be deducted from the overall time duration if they park for a longer period. **Because Duluth does not have significant congestion at the curbside, and because there is a free cell phone lot, a free 30-minute parking program is not recommended.**

Cell Phone Lot – The airport has an existing cell phone lot, accommodating 12 spaces, along Grinden Drive east of the terminal building. Cell phone lots can help reduce congestion at the curbside by providing a space for family and friends to await arrival of their passengers. Some of the benefits of a cell phone waiting lot include reduced traffic circulation, reduced curbside activity, and potentially reduced emissions. The cell phone lot capacity is currently sufficient to meet demand. **Should demand for parking spaces increase, the lot can be expanded approximately 2 spaces to the east and 4 spaces to the to the west to accommodate additional vehicles.**

5.3.4.2 Value Added Products

Valet Parking – Valet parking provides opportunity for customers who are willing to pay a higher fee to drop their vehicles off with an attendant, typically at the curbside or another location with convenient terminal access. The vehicles are then parked in less used lots, reducing congestion in the most desirable parking areas. This is considered a premium product at a parking facility. Often, a third-party vendor is used to provide this service. According to ACRP Report 24, often valet parking produces lower net revenues as the higher parking fees are offset by the higher operating costs (labor, marketing, increased liability). **While the existing traffic levels and customer base at DLH may not be sufficient to support a valet parking operation, it is a service that could be considered seasonally when the parking ramp and lots are at higher capacity and when winter weather makes walking to and from a car less desirable.**

Corporate Parking – The main level of the parking garage has a headed garage with 47 spaces that are leased to individuals or businesses on an annual basis as a premium parking product. Additionally, corporate parking spaces are available for a similar annual lease in the surface lot east of the terminal. These lots enhance the customer experience for business and frequent travelers. Both lot options provide easy and efficient entry and exit without the need to pass through the pay stalls. Upon arrival at the airport, customers using these parking areas can efficiently enter without needing to drive throughout the garage or lots to find an open space. While the heated corporate parking is often leased at capacity, the surface lot typically has spaces available to lease. **No expansion to the corporate parking facilities is recommended.**

Parking for Families – While there are currently no such dedicated spaces at DLH, parking spaces could be reserved for travelers with small children. Typically, these would be best suited for the parking garage as it provides easy access across Grinden Drive via skyway. Dedicated parking spaces could be provided in the existing parking garage and best placed near the doorway to the elevator/skyway. This may provide a beneficial perk for families and further help the airport market its superior customer service and the ease of flying local versus driving to MSP. **The airport should consider the value of dedicated parking spaces for travelers with small children.** Implementation would be low cost through installation of signage.

5.3.4.3 Complementary Customer Services

Vehicle Washing and Servicing – Often offered in conjunction with a valet service, vehicle washing, and servicing allows travelers to have their vehicles serviced while they are traveling. This premium product improves customer services and may increase parking revenues. If Valet parking is introduced in the future, vehicle washing, and servicing can be evaluated as an add on service. If the airport constructs a QTA facility, there is potential to utilize that facility for these services.

Electric Vehicle (EV) Charging – Electric Vehicle (EV) charging at airports is a new and evolving amenity that can be offered for travelers. EV charging technology and the costs associated with providing charging stations continue to evolve with innovative technology and more EVs on the roadways. Purchases of EVs are increasing throughout the United States and approximately 2% of all vehicles sold in the United States in 2018, 2019 and 2020 were electric vehicles. As early as 2014, at least 37 airports in the United States were providing EV charging stations, most commonly in short-term or long-term parking facilities. Most airports were not charging a fee for charging¹.

There are three types (levels) of electrical vehicle charging which are classified by Level 1, Level 2 and Level 3. **Table 5-4** below summarizes the different level chargers and their capabilities

¹ ACRP Synthesis 54, Electric Vehicle Charging Stations at Airport Parking Facilities

Table 5-4 – Summary of EV Charging

Vehicle Charging	Level 1 Chargers	Level 2 Chargers	Level 3 Chargers (DC Fast Chargers)
Estimated miles of range added per hour (RPH) of charging ¹	2-5 miles	10-20 miles	150+ miles
Panel Requirements	120V	208V or 240V	480V
Compatible vehicles	All	All	Select vehicles

Source: Drive Electric Minnesota, Minnesota Power

Level 1 charging stations are generally found in long term parking locations. In most cases the slow rate of Level 1 charging is sufficient for owners if they plan to leave their car for several days. However, the majority of Level 1 chargers are not connected to the internet and drivers could return home from a trip and find their vehicle was unplugged and their battery is low, if not dead.

Most Level 2 chargers are connected to the internet and can provide alerts to drivers on the state of their vehicle and battery. Level 2 chargers are generally preferred because most drivers will prefer to get a faster charge. Drive Electric Minnesota recommends Level 2 chargers in locations where people will spend two hours or more.

Level 3 chargers are meant for the rapid charging of an EV and are typically found along highways and frequent transit routes. Level 3 chargers may require investment in additional infrastructure due to their energy requirements. Additionally, not all EV's can use Level 3 chargers due to the various adapters in the United States. The cold temperatures in Duluth could pose a challenge for utilizing Level 3 chargers following a trip, or after a car is parked in the cold for a long duration, because EV batteries need to be warm before being able to utilize Level 3 rapid charging.

Extreme temperatures can have a negative impact on an EV's battery. As discussed in **Section 2.13**, Duluth's average low in the winter (January) is 1.6 degrees and, in the summer (July), the average high is 76.3 degrees. Freezing weather can reduce the range of an EV since batteries are most efficient between 60- and 80-degrees Fahrenheit. Batteries should always stay between 20 and 80% charged in extreme temperatures. These temperatures should be considered when evaluating the type of charging infrastructure needed at the Airport. DC fast charging (Level 3) should also be limited when experiencing extreme temperatures².

According to the Minnesota Department of Transportation (MnDOT) Electric Vehicle Dashboard³, there are 138 battery electric vehicles (BEV) and 120 plug-in Hybrid vehicles registered in St. Louis County. There is also a total of 31 Level 2 chargers and 7 DC fast chargers in the County. According to the dashboard there are several Level 2 and Level 3 chargers located in the Duluth Area including the Holiday Inn downtown and University of Minnesota Duluth. A Tesla Supercharger is located at the Holiday Inn and most other chargers located in the City are on the [ChargePoint Network](#).

As more electric vehicles are manufactured, the need for charging infrastructure at airport will also increase so drivers can ensure their vehicles remain charged and can be driven home after their trip.

If the Airport decides to install EV charging stations at the airport, the Airport should coordinate with the local utility company to explore potential rebates and incentive. The City of Duluth installed several electric vehicle chargers at a public lot with the coordination of Minnesota Power.

² <https://www.chargepoint.com/blog/5-tips-ev-charging-hot-weather/>

³ <https://www.dot.state.mn.us/sustainability/electric-vehicle-dashboard.html>

According to ACRP Synthesis 54, *Electric Vehicle Charging Stations at Airport Parking Facilities*, most Airport sponsors will install a small number of electric vehicle charging stations based on the amount of funding and grant money available and locate the charging stations in an area where there is potential to expand. Most airports do not charge for EV charging if the chargers are in paid lots. Due to the cold winters in Duluth, Level 1 EV chargers may not provide enough power to keep the batteries warm during the winter. Level 3 chargers may provide more power than needed for long-term vehicle parking since Level 3 chargers are generally recommended where passengers stay for less than 24 hours, typically in a daily lot. ***It is recommended that the Airport install Level 2 Electric Vehicle chargers at the airport in a paid parking lot. Figure 5-1*** shows the potential locations of electric vehicle charging stations. EV charging could be added to either, or both, the parking garage and surface lot. When considering expansion, expanded facilities may be best accommodated on the surface lot.

Loyalty Programs – Loyalty programs that recognize and reward frequent parkers can help improve services by determining the preferences of frequent customers. The airport currently uses *Thanks Again* as a loyalty program for parking and shopping within DLH and 150+ other airports in the program.

5.3.4.4 Parking Space Availability and Guidance Systems

Parking availability can be provided via a display for each area of parking at an airport (levels of garages, garage, surface lots, etc.). This can help improve customer service by reducing time for customers to drive through areas looking for an open space. In addition to improved customer service, the technology used for this type of system can provide data that can be used to better understand parking trends and usage and inform future planning and pricing decisions. Currently, the parking garage is at capacity during periods of high travel. Capacity is observed in person and noted by a movable sign being placed by a staff member at the garage entrance. This is labor intensive and does not always provide accurate information to customers.

Loop detectors embedded in the pavement are typically used for parking space availability systems. License plate recognition systems may also be used to support this type of system. ***The airport should consider the installation of needed technology to provide parking space availability to customers for both the parking garage and surface lot when the parking management system and technology is next replaced or upgraded.***

5.3.4.5 Cashierless Transaction

Exit lane delays can be reduced through introduction of a **pay-on-foot (POF) system** in the terminal. These systems typically accept cash or credit card; however, systems that accept only credit cards are more cost effective. POF systems could be best placed in the terminal on the mezzanine level and on the main level near baggage claim. ***The airport should consider addition of POF systems when the parking management system and technology is next replaced or upgraded.***

Credit card in/out systems can also be implemented to improve the customer experience. In these systems, customers utilize a credit card to enter and the same credit card to exit, eliminating the need for a parking ticket. These systems typically have faster processing times in exit lanes. Some airports with this technology implement a higher rate for customers who opt to utilize cash or not choose the credit card in/out system and prefer a paper parking ticket. ACRP Report #24 noted that airports report a high adoption of this technology, with 75% of all customers choosing credit card in/out systems within two years of implementation. This type of system can be combined and used with POF systems as well. ***The airport should consider the introduction of credit card in/out system when the parking management system and technology is next replaced or upgraded.***

Regardless of the introduction of POF or credit card in/out systems, a cashierless exit lane can be provided. While this technology was less common when the terminal was constructed, this technology and type of operation is typical in most pay lots in Duluth. With increase customer acceptance of this type of system, the

airport should consider if a shift to a cashierless system may increase revenue while still providing adequate customer service. Remote support can still be provided to vehicles in the exit lane through a speaker system. **The airport should consider a transition to a cashierless exit lane when the parking management system and technology is next replaced or upgraded.**

License Plate Recognition can be used to substitute a parking ticket and reduce exit plaza delays. This technology has been commonly used as a complementary technology to other technology systems. The snow that may cover license plates in winter months should be considered in implementation of any system that utilizes this technology in Duluth.

5.3.4.6 Pricing Structure

The pricing structure for parking at DLH is currently the same for both the surface lot as well as the parking garage. The parking garage is typically preferred as it offers covered spaces and more convenient access to the terminal (via skyway), and it could be considered a premium parking area. Demand for differing parking products (garage versus paved lot, in the case of DLH), can be balanced through a variable pricing structure. Varied parking rates provide the opportunity for increased revenue as higher rates are charged for premium products.

Varied pricing structure for the garage and paved lots can be provided through technology upgrades using the existing entry and exit lanes. Currently, there are separate entry lanes for garage and paved lot customers. When the parking management system and technology is next replaced, a varied rate system can be installed so that customers choosing to park in the garage are charged a different rate than paved lot customers. While separate entrance lanes are required, the same exit lane can be used.

Parking space availability systems are an important complementary technology to a varied rate system as it will be important to notify customers if the parking garage is at capacity. A higher rate for the parking garage also allows other premium and value-added products, such as dedicated family parking spaces, to be marketed to increase the desirability of the higher rate parking.

The airport should install a varied rate system for the two parking products (garage and paved surface lot) when the parking management system and technology is next replaced or upgraded.

If the airport introduces varied rates for the different products (garage and paved surface lot), branding of the two products may be important. The name could clearly convey the product being offered (Garage vs. Economy Lot) or it could help a customer remember where they parked (lots named after animals or places). The airport should consider the importance of distinguishing parking products and wayfinding to determine which type of branding best suits the parking products. **Branding of parking products should be implemented if varied pricing structures are introduced.**

5.3.5 Terminal Vehicle Roadway and Parking Lot Pavement

Grinden Drive provides one-way road access to the terminal and parking facilities. The asphalt pavement is in very good condition. Ongoing preventative maintenance (crack seal) is recommended every other year, or at least every 3 years (see Landside Pavement Assessment report for additional details). If adequate ongoing pavement maintenance is used over the next 5-10 years, a more substantial rehabilitation or reconstruction project may not be needed in the next 15 years. Pavement rehabilitation or reconstruction is likely to be needed in the next 15-20 years.

5.3.6 Streetlamps and Overhead Lighting

Streetlamps are installed on Grinden Drive leading from the Airport Road and Haines Road intersection, the airport also has lighting installed in the surface lot. There are 35 light poles (45 heads) on the roadway and 24 light poles (44 heads) located in the surface lot. Advances in LED technology and cost reductions since then

have made LED lighting the system of choice in most applications. Minnesota Power may provide rebates for LED lighting retrofits and other energy saving measures. Retrofitting the light poles with LEDs is estimated to cost approximately \$90,000.

It is recommended the airport upgrade the terminal roadway and surface lot lighting to LED. The Airport should coordinate with Minnesota Power to determine if there are available rebate programs.

5.3.7 Rental Car Facilities

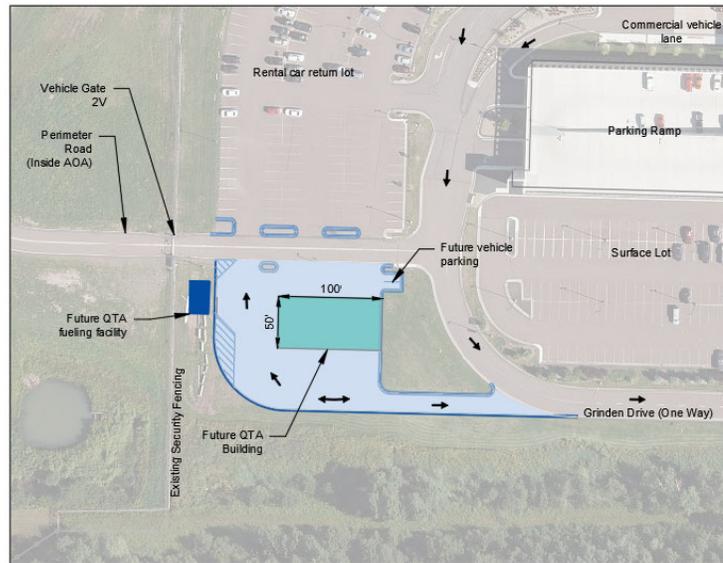
Parking lots for the rental car facilities include a parking location near the terminal for rental car pick-up as well as a long-term storage lot where rental cars can be stored. Currently, the existing parking capacity (surface lot for rental return and storage and garage parking for rental pickups) is sufficient for the car rental parking needs and no car rental tenant expressed need for more parking space.

Currently, car rental agencies take vehicles to off-site locations to clean, maintain and fuel their fleet. This operation may result in the need for a larger vehicle fleet and increased staffing. Often, a quick-turn-around (QTA) facility is used to provide on-site servicing of vehicles. Generally, these facilities are located near the rental car parking lot and support a car wash, maintenance bays and fueling needs. In addition to helping better manage fleet sizes and vehicle turnaround times, having a QTA at an airport can reduce carbon emissions since vehicles no longer need to drive to an off-airport location. The ideal location for a QTA is located directly south of the existing rental car lot. This area has been previously disturbed during terminal construction and can provide efficient access to and from the car rental lot. A QTA facility at DLH could be constructed to be a common use facility, meaning all car rental agencies can utilize it and the airport charges them on a per use or other fee structure basis. This reduces the cost of construction as separate bays and infrastructure for each agency is not needed.

QTAs vary in size depending on the need, however ***a facility of approximately 8,000 square feet in size is recommended in the near-term at DLH.*** This size of facility should accommodate space for automatic car wash bays, auto-detailing bays, maintenance, equipment, and storage space. Adjacent fueling could be provided.

A conceptual layout of a QTA facility is depicted on **Figure 5-1** and below in **Exhibit 5-1**. This facility provides access for vehicles to enter from the car rental lot and return to the lot without using Grinden Drive. Additionally, access for vehicles to exit via Grinden Drive is provided if needed. The site is designed to allow for fuel tanker trucks to maneuver through the site and provide fuel to a fuel tank system located on the west side of the QTA development. A QTA facility can provide an additional revenue source for the airport and can be funded through Customer Facility Charges (CFCs).

Exhibit 5-1 – Rental Car QTA Facility



It is recommended that a Siting and Feasibility Analysis study be conducted prior to designing a QTA facility. This study is recommended to be completed in 2023 with design and construction of a QTA to follow in 2024, pending availability of funding.

5.4 Ground Transportation

5.4.1 Transportation Network Companies (TNC)

As discussed in **Section 2.14.8** Uber and Lyft have a presence in Duluth and provide transportation to and from the Airport, with higher pickup than drop off activity. ACRP Report 215, *TNCs: Impacts to Airport Revenues and Operations- Reference Guide* found that approximately 40% of pick-up locations for TNCs were located on the curb near the baggage claim area and 33% were located in a commercial vehicle lane. Due to a raise in passenger levels, several airports have moved TNC operations to their commercial vehicle lanes to reduce congestion on the pickup and drop off curbs while other airports have relocated TNC operations to surface lots near the baggage claim.

TNC drop off currently occurs on the curbside. TNC companies pick up passengers in the parking lot west of the terminal in designated parking spots as the original desire was to separate this activity from taxi activity. Passengers walk from the Terminal to the parking lot to find their assigned driver. The existing TNC pickup location is challenging for some passengers to locate. Additionally, there is no shelter or physical landmark for passengers to wait by.

It is recommended that a TNC pickup shelter be added to the pickup location to provide both a landmark for passengers as well as shelter from inclement weather. The TNC pickup shelter could be located near the existing pickup location in the car rental lot west of the terminal, or it could be located in the commercial vehicle lane. Although it is helpful for all pickups to occur in a similar location (ie. Commercial vehicle lane), passengers are accustomed to TNC pickups being in a separate location at an airport. If congestion is not an issue, the commercial vehicle lane may provide the most well identified and expected location for TNC pickups. It would also help minimize

Designated TNC Pick-Up Locations



pedestrian traffic in the car rental lot. Pedestrian traffic crossing the entry lane to the car rental return lot may pose a safety hazard as drivers may be unfamiliar with the airport and not expecting pedestrian traffic in that area as they do in front of a terminal in well-marked crosswalk areas. The traffic flow for TNC vehicles in and out of the car rental lot is not efficient and may pose congestion in the entry/exit point during periods of high traffic. Also, there is limited space for a TNC shelter in the car rental lot without placing it in a parking space. ***It is recommended that a TNC shelter and designated pickup location with appropriate wayfinding be constructed in the commercial vehicle lane.***

5.4.2 Bus Service – Duluth Transit Authority

As discussed in **Section 2.14.8**, the Duluth Transit Authority (DTA) provides bus service to Duluth and there are several routes that provide access to the airport. No bus stops currently exist for the business development areas or the Air National Guard Base. DTA indicated that Airport ridership is sporadic, and many riders use the bus to get to the airport to rent a vehicle. Daily average boardings on DTA busses are 12 passengers and the average daily number of passengers getting off at that Airport is 11 passengers.

The airport should continue to work with DTA to ensure bus schedules best meet the needs of employees and passengers using bus services to travel to/from DLH. Additionally, the airport should work with tenants and stakeholders to evaluate the need for bus service to other areas of the airport.

5.4.3 Autonomous Vehicles

In 2017, [Boston Consulting Group](#) estimated by 2030, nearly a quarter of “all miles driven” in the US would be from shared self-driving cars. More recently, automakers expect that autonomous vehicles will be operational on roads closer to 2050, even though about 15% of the public believe that autonomous vehicle will never be fully deployed. The reality is, although questions of legislation, liability and ethics remain, nearly all major automotive companies have autonomous vehicles in the works, being tested and/or on the road. It’s important for municipalities to consider just how much this innovation could impact how roadways, intersections and pedestrian crossings are designed.

If driverless cars have the predicted effectiveness over current drivers, the same traffic volumes could flow through a narrower roadway designed with narrower lanes and fewer of them. In fact, lanes likely wouldn’t need to be much wider than a delivery truck. In addition, when we can confidently rely on vehicle sensors and interconnectivity, there will be no need for the same visual cues (e.g., road striping and signage) that human drivers rely on.

There are still several hurdles that manufacturers, developers, state and federal officials need to overcome before autonomous vehicles become mainstream.

Below are several recommendations on how to plan and prepare for autonomous vehicles.

- **Stay informed, be proactive.** The State of Minnesota established a Governor’s Advisory Council on Connected and Automated Vehicles (CAV). This Advisory Council – through facilitated sessions involving state liaisons, experts, stakeholders and the public – meet regularly to share ideas and feedback on how CAV technology will impact the lives of Minnesotans. White Bear Lake (MN) plans to have autonomous shuttle pilot programs beginning in 2021, additionally the Mayo Clinic in Rochester Minnesota began a yearlong pilot program called the Med City Mover in July of 2021⁴. ***The Airport should continue to monitor these State sponsored pilot programs as well as MnDOT’s Connected and Automated Vehicle Office (CAV-X) for project updates.***
- **Be intentional but realistic about the roadways being designing today.** Predictions are that cities will become more human-centered as technology continues to change our transportation; we’re

⁴ <http://www.dot.state.mn.us/medcitymover/>

already seeing this with the continued rise of “complete streets” design across the U.S. It’s important to understand that, despite the continued efforts to introduce driverless cars on our streets, roads will still need to be designed to accommodate human drivers. By planning corridors for a more equal mix of modes, transportation infrastructure can be positioned in line with present day trends while making it less challenging to accommodate what’s ahead. ***The Airport should coordinate with the City of Duluth and the Metropolitan Interstate Council (MIC) when they begin to plan for and implement autonomous vehicles into City and Regional transportation planning.***

Additional information on MnDOT Connected and Automated Vehicles Office can be found on their [website](#).

5.4.4 Urban Air Mobility

According to the FAA, Urban Air Mobility (UAM), sometimes called Advanced Airport Mobility, envisions a safe and efficient aviation transportation system that uses automated aircraft to operate and transport passengers or cargo within urban and suburban areas at a low altitude. UAM is an evolving technology, like autonomous vehicles. Initially, the FAA envisions UAM will utilize the existing helicopter infrastructure in the NAS and air traffic control services. Several research and development firms are working in collaboration with NASA and the FAA to evaluate UAM. As recently as August 30th, 2021, NASA began flight testing an all-electric vertical takeoff and landing (eVTOL) aircraft manufactured by Joby Aviation. This testing of the eVTOL is part of NASA’s Advanced Airport Mobility (AAM) Campaign. The goal of the campaign is to help develop and validate the technology and solutions for AAM.

The Airport Cooperative Research Program (ACRP) is expected to complete ACRP 03-50 *An Airport-Centric Study of the Urban Air Mobility Market* in November of 2021. The report is expected to highlight the technologies, impacts and opportunities for airports and planning considerations for the implementation of UAM. ***It is recommended the Airport review the ACRP report once it is published to identify ways to prepare for and identify opportunities of UAM.***

5.5 SRE and Maintenance Equipment

As discussed in **Section 2.15.1** the Airport owns and operates a fleet of snow removal equipment for snow removal operations. The equipment was purchased using Federal, State and local funding and the funding source varies for each piece of equipment.

The FAA uses an SRE and maintenance equipment calculation to determine the number of eligible pieces of equipment. DLH has a published and FAA approved Snow and Ice Control Plan (SICP) included in the Airport Certification Manual (ACM). The SICP is required under 14 CFR §139.313. Within the SICP all Priority 1 surfaces are identified which includes the primary runway (Runway 9/27 10,591x150’), three connector taxiways, Taxiway A, Taxiway B, the commercial service apron ILS critical areas and ARFF access routes. Using the SRE Calculator, the total square footage needed for snow removal was calculated with all Priority 1 surfaces. For this calculation, 75% of the terminal apron was considered critical due to the space constraints currently experienced and includes the recent terminal apron expansion to the east of the existing pavement. Based on this calculator, DLH is eligible for: The calculations for DLH are shown below in **Table 5-5**.

Table 5-5 – FAA Eligible SRE Maintenance Equipment

Type	Eligible for FAA (AIP) Funding
Rotary Plow	3
Displacement Plow	6
Sweeper	6
Hopper Spreader	6
Front End Loader	1

Table 5-6 shows the existing SRE fleet the Airport owns.

Table 5-6 – Airport Owned Snow Removal Equipment (SRE)

Unit	Equipment Type	Brand	Model	Manufacturing Year	Funding Source	Grant Number	Planned Replacement Year
13	Plow	Oshkosh	HB237	1997	90% / 10%		2029
16	Plow	Oshkosh	P2525-SP	1987	90% / 10%	AIP-07	2026
17	Grader	Caterpillar	163H	2005	PFC 6		2034
18	Grader	Caterpillar	163H	1997	90% / 10%		2030
19	Grader	Caterpillar	163M3AWD	2015	90%/5%/5%	AIP-58 / SP-182	2037
20	Blower	Oshkosh	H2723B	2008	100% Federal		2028
22	Blower	Oshkosh	H2718B	2001	PFC 4		2024
28	Loader	Caterpillar	IT62G	2005	PFC 6		2026
29	Sander	Chevrolet	4500 Kodiak	1999	90% / 10%	AIP-26	2035
30	Loader	Caterpillar	972M	2015	90%/5%/5%	AIP-58 / SP-182	2038
36	Multi-purpose	Oshkosh	HT2926	2014	70%/15%/15% %	AIP-57 / SP-179	2025
37	Sweeper	Oshkosh	HB2723	2005	95% / 5%	AIP-37	2025 (Multi) 2039
42	Sander	GMC	8000	1979			2021
43	Loader	Caterpillar	930G	2005			2031

Source: DAA Staff

No additional SRE are needed to meet the requirements that are outlined in FAA Advisory Circular 150/5220-20, *Airport Snow and Ice Control Equipment* and 150/5200-30, *Airport Winter Safety and Operations*. The Airport should replace older pieces of equipment as they reach the end of their useful life. The airport has expressed an interest in replacing single purpose equipment with multi-purpose units (see **Photo 1**). These units are more efficient and cost effective compared to operating several pieces of equipment serving single purposes. Having less vehicles operate in the movement area in low visibility conditions also has the potential



to increase safety.

Photo 1 Example Multi-Purpose SRE (Plow and towed airport broom)

SRE equipment is eligible for replacement after 10 years; however, equipment can often be useful for 15 years depending on usage and maintenance. The airport has developed an equipment replacement plan for the SRE, mowing and vehicle fleet. **The SRE vehicles should be replaced based on the vehicle replacement plan and available funding.** The replacement plan from the Vehicle Replacement Plan is

included in the CIP found in **Chapter 7**. SRE replacement needs should be evaluated annually, and the Vehicle Replacement Plan updated as needed. Near-term SRE acquisitions include:

- 2023: Multi-Purpose Unit (plow and broom)
- 2024: Replace Blower #22
- 2025: Multi-Purpose Unit (plow and broom)
- 2026: Batwing Plow #16, Loader #28
- 2027: Sweeper #37
- 2028: Blower #20
- 2029: Batwing Plow #13

5.5.1 SRE/Maintenance Equipment Building

The existing 36,000 square foot SRE Building, which was built in 2003, is located south of Taxiway A in-between the Monaco and Midfield Ramps. The SRE houses the SRE fleet of over forty pieces of snow removal and maintenance equipment as well as the offices for maintenance personnel. The SRE building also has heated sand storage, as required by the FAA. Buildings are eligible for FAA funding once they reach the end of the useful life, or 40-years. The SRE building is not eligible for replacement until 2043 or later which is outside this planning period.

As part of this Master Plan effort, a building assessment was completed on the SRE building (see **Appendix C**). This assessment identified several maintenance projects for the SRE building. ***Recommended maintenance projects include replacing sealant at exterior precast concrete wall panel joints, replacing sealant joints between the butt jointed sections of glass at the curtain wall system, clean and repainting of exterior hollow-metal doors and frames and servicing the sectional 4-fold garage bay service doors and their operable components.***

Airport maintenance staff have indicated that the SRE building does not have enough room to safely operate vehicles inside due to the sand storage and limited parking locations. The Airport has also indicated there may be future interested in implementing deicing procedures for the movement area due to the increase in ice events during winter months and to decrease the use of brooms which leave behind bristles that are a FOD hazard to F-16 aircraft operated by the 148th Fighter Wing. As such, ***it is recommended that the airport construct a heated sand and chemical storage building to house the airside chemicals and to relocate the sand storage out of the existing SRE building.*** **Note to Reviewer:** Additional alternative are being developed and will be included in Exhibit 5-2.

Exhibit 5-2 – Sand and Chemical Storage Building

5.6 Part 139: Aircraft Rescue and Firefighting (ARFF)

A major item of Part 139 pertains to ARFF services that must be provided at a certificated airport. Part 139 dictates the number of personnel, type, and quantity of firefighting equipment required based on the largest commercial aircraft with five or more flights daily. An Index is assigned to each airport based on a combination of air carrier aircraft lengths, as shown in **Table 5-7**. This Index determines the required number and type of ARFF vehicles, and the amount of water and Aqueous Film Forming Foam (AFFF) needed at the Airport.

Table 5-7 – ARFF Index Determination

ARFF Index	Aircraft Length (Feet)
A	<90
B	>90≤126
C	>126≤159
D	>159≤200
E	>200

Source: 14 CFR Part 139, Certification of Airports. Part 139.315.

DLH has an ARFF Index B. Part 139 requires Index B airports to have the following⁵:

One vehicle carrying:

1. One vehicle carrying at least 500 pounds of sodium-based dry chemical, halon 1211, or clean agent; or 450 pounds of potassium-based dry chemical and water with a commensurate quantity of AFFF to total 100 gallons for simultaneous dry chemical; and
2. 1,500 gallons of water and the commensurate quantity of AFFF

OR

Two vehicles carrying:

1. One vehicle carrying:
 - a. at least 500 pounds of sodium-based dry chemical, halon 1211, or clean agent; or
 - b. 450 pounds of potassium-based dry chemical and water with a commensurate quantity of AFFF to total 100 gallons for simultaneous dry chemical
2. One vehicle carrying an amount of water and the commensurate quantity of AFFF so the total quantity of water for foam production carried by both vehicles is at least 1,500 gallons.



DLH meets the requirements of Index B and has the equipment and staffing to provide for Index D (See **Section 2.15.3**). At the Airport, ARFF emergency services are provided by the 148th Air National Guard staff and their equipment. Based on the aviation activity forecast and the future critical aircraft **no improvements to ARFF services are needed**.

The location of the ARFF building provides for the 14 CFR Part 139 response time of three minutes to the mid-point of the furthest runway, which is approximately the intersection of Runway 09/27 and Runway 3/21.

5.6.1 Aircraft Rescue and Firefighting Access Route

Aircraft Rescue and Firefighting (ARFF) is provided by the 148th Air National Guard. Under 14 CFR Part 139 Aircraft Rescue and Firefighters are required to be able to reach the midpoint of the furthest air carrier runway in under three minutes, this requirement is continuously met by the ARFF department. ARFF is also responsible for first responder emergency medical services at the airport.

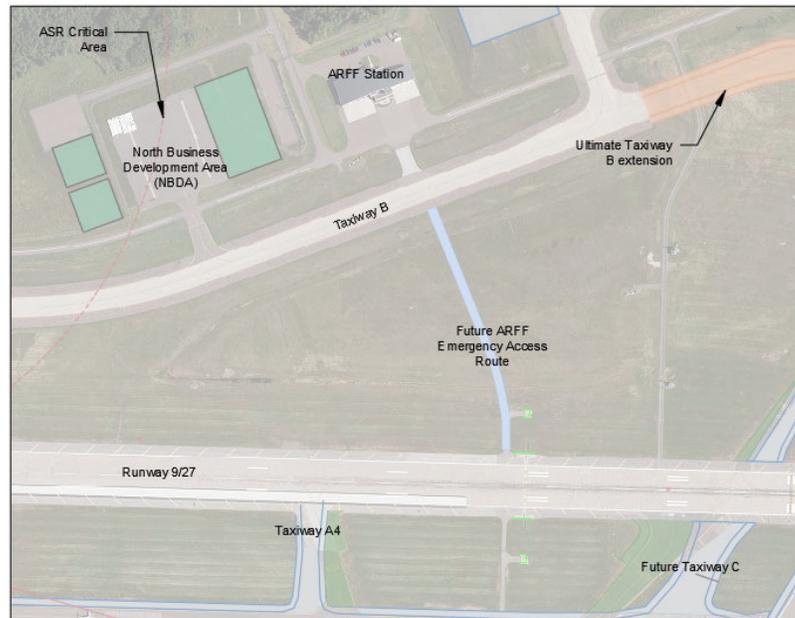
Existing airfield layout requires ARFF vehicles to travel away from the majority of facilities at the airport and make sharp, 90-degree turns. ARFF vehicles are very top heavy and are unable to make high speed, sharp

⁵ Federal Aviation Regulations (FARs) Part 139, Certification of Airports

turns safely. During the Taxiway TAC meetings, the ARFF Fire Chief indicated that an additional access roadway directly to Runway 9/27 would increase safety. Additionally, Runway 3/21 is expected to be extended to a total runway length of 8,000 feet, with a 2,281-extension occurring to the northeast.

It is recommended that an emergency vehicle access road be constructed to provide access to Runway 9/27 and Runway 3/21 and the radius of the turns should be able to allow for ARFF vehicles at safely make the turn at a higher rate of speed. The recommended road is shown in Exhibit 5-3.

Exhibit 5-3 – ARFF Emergency Access Road



5.7 Aviation Support Facility Recommendations

5.7.1 Aviation Fuel

DLH has a self-service fuel system located at the eastern side of the Monaco Ramp. The FBO currently provides fueling services to the airlines and GA aircraft. **Section 2.15.4** discusses the aviation fueling facilities in depth. The fueling system consists of one 10,000 aboveground storage tanks containing Aviation Gas (AvGas, 100LL) and four 10,000-gallon aboveground storage tank containing Jet Fuel (Jet A). All tanks were installed in 1999 and are registered with the Minnesota Pollution Control Agency (MPCA). The Airport does not own a fuel truck or conduct any of the aircraft fueling operations at the airport. The FBO indicated that there was no fuel capacity challenges and they are not expected through his planning period. If needed, there is space to expand the fueling capacity at the existing fuel farm.

The 148th Air National Guard has their own fuel storage and controls their fueling operations.

5.7.1.1 AvGas Replacement

AvGas is the only transportation fuel that still contains lead. Lead is a toxic substance that can be inhaled or absorbed in the blood stream. The FAA is supporting the research of alternate fuels and is working with the aircraft and engine manufacturers, fuel producers, the EPA, and industry associations to overcome technical and logistical challenges to developing and deploying a new unleaded fuel. The FAA is also working with the EPA to make a smooth transition from leaded to unleaded aviation fuels and to ensure the supply of aviation gasoline is not interrupted so that all aircraft can continue to fly.⁶ ***It is recommended that DLH, in***

⁶ Aviation Gasoline. <http://www.faa.gov/about/initiatives/avgas/>

coordination with the FBO, continue to monitor the FAA's and EPA's progress for updated regulations and replacements for AvGas, such as the 100LL currently sold at DLH.

5.7.2 Automobile Parking and Access Roads

The majority of the general aviation facilities are in the southwest quadrant of the runway intersection and located west of the cargo ramp and south of the Monaco and Tower Ramps. Airport Road provides a route through this area with a network of access roads that provide access to and from hangars, parking lots and general aviation facilities. The DAA owned access roads and parking lots are generally in fair to poor condition and in need of repair (See **Figure 2-17**). The Landside Pavement Assessment completed as part of this Master Plan provides information on the pavement condition of each pavement, its use and priority for maintenance and improvement. Several near-term projects have been identified for pavement maintenance in 2022 and 2023. They include:

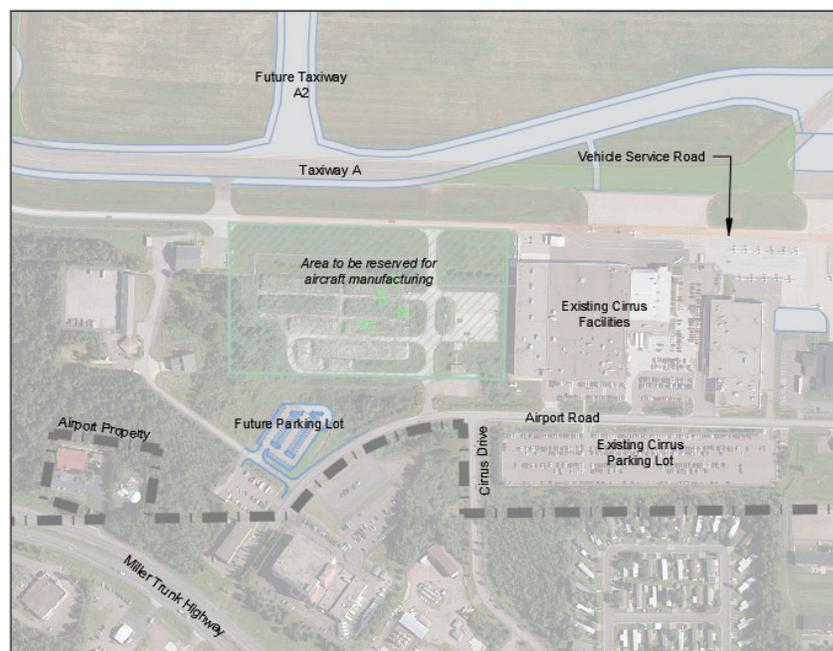
- Griden Road Preventative Maintenance
- Perimeter Road Preventative Maintenance

In years 2024 and beyond, it is recommended that the airport evaluate pavement condition, use, and need to determine the appropriate landside pavement maintenance project for each year. Landside pavement maintenance should be planned and budgeted for in each year to ensure preservation of prior investments. See the Landside Pavement Maintenance Report in **Appendix E** for more information. A placeholder for \$100,000 of landside pavement maintenance will be included in each year of the CIP in years 2024 and beyond.

There are several public and private tenant lots that are utilized for vehicle parking in the southwest quadrant. Several stakeholders indicated that there is a shortage of auto parking spaces to meet tenant and airport user needs. Lake Superior College (LSC) and Cirrus have all indicated the need to for more parking. Vehicle parking should be considered during design of future facilities in the southwest quadrant as space is limited in this area of the airport.

The airport owns two parking lots that are currently leased to a non-aeronautical tenant at the end of Airport Road. These lots are in fair condition and in need of major rehabilitation. Portions of the northern lot is included in a lease to the 148th as part of the DRMO environmental site cleanup located to the north of the lot. The southern lot is leased to a non-aeronautical tenant through 2024. These lots could be repurposed in the future to meet the parking needs of an expanded Cirrus operation. A potential layout of future parking in this area is shown in **Exhibit 5-4**.

Exhibit 5-4 – Future Cirrus Parking Lot



The North Business Development Area has auto parking already constructed for future development in this area. Depending on the type of development that is ultimately constructed, auto parking may need to be expanded to meet tenant needs.

5.7.3 Airport Fencing

The airport is surrounded by security and wildlife fencing to ensure unauthorized persons and wildlife do not gain access to the airfield. Both security and wildlife fencing are eight feet tall with two feet of barbed wire. Portions of the wildlife fencing include a deterrent skirt buried in the ground to help deter wildlife from digging under the fence. Gates are located around the perimeter to allow access for personnel with proper identification. Upgraded wildlife fencing and electronic gates were installed in 2017. **Figure 2-16** shows the perimeter fencing and perimeter gate access at the Airport. The fence located on the east side of Runway 3/21 and the perimeter road that goes around the approach end of Runway 3 is wildlife fencing, which has a wildlife skirt and 3-strand barb wire atop. Minnesota Administrative Rules and the MnDOT SASP requires all licensed airports to have “sufficient” fencing around the Airport property to prevent people who are not engaged in aviation activities from accessing the aircraft movement areas.

FAA Certalert No. 16-03, Recommended Wildlife Exclusion Fencing, recommends a 10-foot chain-link fence with 3-strand barbed wire outriggers⁷ and fence skirting to keep wildlife off airport property. Additionally, it notes that the fence line should be inspected daily, and a fence inspection schedule should be included in an airport’s Wildlife Hazard Management Plan (WHMP).

It is recommended the airport continues to monitor wildlife in and around the airport and install wildlife skirting in areas where wildlife frequently dig under the fence.

⁷ In some cases, an airport may be able to use an 8-foot fence with 3-strand barbed-wire outriggers, depending on the amount of deer activity in a local area.

5.7.4 Wildlife Hazard Mitigation

As discussed in **Section 2.3.1** Error! Reference source not found., DLH is a Certificated Part 139 Airport and, under this federal regulation, requires a Wildlife Hazard Management Plan (WHMP). The WHMP is approved by the FAA and included in the Airport Certification Manual (ACM). The following recommendations are provided in the WHMP and considered methods to reduce deer and mammal as well as geese, gull, waterfowl and other hazardous birds on the Airport.

- Maintain the grass as defined in the WHMP.
- Ensure all agricultural activity on or near Airport property adheres to Advisory Circular 150/5200-33C, Hazardous Wildlife Attractants on or near Airports
- Remove vegetation from all drainage ditches to ensure flow of drainage water is maintained
- Identify areas of standing water following heavy rains for filling or draining
- Continued removal of any trees and woody vegetation.
- Remove older hangar structures and continue to maintain false ceilings
- Install anti-perching devices, as well as remove of any non-active structures or poles on or near the airfield
- Implement mammal poisoning efforts as needed
- Wildlife hazard training for airport staff to help in wildlife identification and proper harassment methods
- Report all wildlife strikes in the FAA Wildlife Strike Database, as well as provide copies of the Wildlife Strike Report Form within the A/D building for pilots and airport personnel to easily fill out.

In 2016, the Airport created an Airport Landscape Plan. The City of Duluth encourages planting trees wherever possible to achieve the City's goal of a cleaner, greener, and more sustainable environment. The Airport developed this landscape plan as a resource and guide to assist developers and tenants of the airport. The goal of this plan provides information about the types of plants that are acceptable and preferred by the Airport while encouraging sustainability but also by ensuring landscapes are not wildlife attractants. As part of this Master Plan, several sites have been identified for aeronautical and non-aeronautical development. ***It is recommended the airport share this plan with developers to ensure the landscapes are compatible with aviation safety.***

5.8 DAA Owned Buildings

5.8.1 Building Condition Assessments

As part of this Master Plan, building condition assessments were conducted on DAA owned buildings. These assessments rated the overall condition of the building and made recommendations for maintenance projects. Several buildings were identified as 'critical buildings and a more detailed assessment was completed for these buildings. These buildings were those that serve a critical function at DLH or those that may be in an area for redevelopment. The DAA-owned buildings assessed in more detail include:

- Hangar 103 (Lake Superior College)
- Hangar 104 (GA hangar)
- Hangars 105-108 (GA hangars)
- Electrical Vault
- SRE Building
- Hydro Solutions Building (non-aeronautical tenant)
- 311 Building (Cirrus)

- DAA T-Hangars (Building 608)
- DAA Ranch Hangars (Building 614)
- DAA T-Hangars (Building 615)
- ATCT Building
- Terminal Building

Results of the building assessments are included in **Appendix C**. Based on the building assessments, several near-term (2022-2024) building maintenance projects have been identified and are included in the CIP. These include:

- Hangar 101 Removal – Removal of the hangar due to deteriorating and unsafe conditions
- ATCT Building Improvements – Improvements needed to support ongoing operation until a new tower is constructed.
- DHL Building Demolition – Demolition to enable future aeronautical development
- Hydrosolutions Demolition – Demolition to enable future aeronautical development

In years 2025 and beyond, a CIP project for miscellaneous building maintenance at an estimated cost of \$100,000 is included in the CIP. It is expected that DAA will evaluate building and tenant needs to determine the highest need projects that can be accomplished within available funding each year.

5.8.2 Phase 1 Environmental Site Assessments

Phase 1 Environmental Site Assessments (ESAs) were completed on Hangar 101, the Hydrosolutions building and Hermantown Hydraulics as it was expected that these buildings would be candidates for removal to enable aeronautical development needs. The results of the Phase 1 ESAs are included in **Appendix C**. This effort identified Historical Recognized Environmental Conditions (HRECs) for each site. Additional Regulated Materials Assessments should be completed prior to demolition of each structure to fully identify regulated material and ensure of proper disposal.

5.8.3 Architectural History Reconnaissance Surveys

As part of the Master Plan, buildings over 50 years of age were evaluated through an Architectural History Reconnaissance Survey to inform future planning and redevelopment in the building area. The effort included a field survey to identify structures that are 45 years of age or older that have not been previously evaluated within the last 10 years was completed and the properties were evaluated for potential eligibility for listing on the National Register of Historic Places (NRHP). 12 properties 45 years of age or older that had not previously been evaluated were identified. 11 of the properties were not recommended for further intensive survey due to lack of historical significance and/or a loss of integrity. However, Hangar 101 was identified as potentially eligible for listing on the NRHP. **Appendix I** includes the Architectural History Reconnaissance Survey.

Separate from this Master Plan, an Intensive Architectural History Survey was completed on Hangar 101 as part of the design of the hangar demolition project. The results of this effort recommended that Hangar 101 is eligible for listing on the NRHP. Because of this designation, an Environmental Assessment (EA) will be the required NEPA review document to evaluate the impacts of demolition of the hangar. ***An EA should be initiated in 2021 ahead of the planned demolition in 2022.***

5.9 Airport Property, Acquisition, and Easements

Any airport property, when described in a grant or listed in the [Exhibit A Property Map](#), is considered to be “dedicated” or obligated property for airport purposes only and is subject to all FAA Airport Sponsor Grant Assurances. Airport Grant Assurances, in relation to airport property, require airport sponsors, such as DLH,

to hold a good working title (#4), preserve all rights and powers (#5), ensure compatible land uses (#21), and to keep an updated Airport Layout Plan (ALP) showing boundaries of the Airport, all existing and proposed airport facilities, location of all existing and proposed non-aeronautical use areas (#29). When non-aeronautical uses exist on an airport but are not properly documented and are not approved by the FAA, they are considered encroachments to airport property.

As discussed in **Section 2.19**, per the owners and encumbrances report, the Airport currently owns 3,265 acres in fee, and an additional 466.80 acres in Avigation easements (see **Section 2.19** Error! Reference source not found., **Figure 2-26** Error! Reference source not found.).

The Exhibit A Property Map (2021) is included in **Appendix G** and summarizes each tract of land own by the Airport, and right-of-way, utility, avigation easement, and possible encroachments to Airport property. Please note, a boundary survey was not included in the scope for this project and is typically not an eligible item for federal funding. For the purpose of the Exhibit 'A' Property Map, airport parcels and boundaries, airport easements, and airport encumbrances are computed and shown based on the best information available including the following, but not limited to record documents, record plats, record surveys, record right of way maps and/or plats, published section corner information, G.I.S. data obtained from the local government unit. The Exhibit 'A' Property Map does not constitute a boundary survey of any airport parcel, airport easement, or encumbrance shown thereon.

MnDOT Aeronautics requires airports to have adequate Clear Zones in place to restrict land uses that may be hazardous to the operational safety of aircraft and to protect life and property in the runway approach areas.

The Clear Zone dimensions for existing and future runway conditions are shown in **Table 5-8** and are shown in **Figure 5-2**. All land within Runway 9/27's and Runway 3/21's existing and future MnDOT Clears Zones is owned or controlled by the Airport. The RPZ is a trapezoidal shaped area off each runway end designed to enhance the safety and protection of people and property on the ground. To ensure that the RPZ is kept clear of incompatible uses, the FAA recommends that the RPZ should be controlled by the Airport sponsor, either by fee or easement. As shown in **Figure 5-2**, all of the land within Runway 9/27 and Runway 3/21's existing and future RPZs is owned or controlled by the Airport. No property acquisition is needed to protect the MnDOT Clear Zone or RPZ.

No additional property acquisition is required to meet the aeronautical needs of the airport.

Table 5-8 – RPZ and MnDOT Clear Zone Dimensions

Surface	Runway	Inner Width	Length	Outer Width
FAA Runway Protection Zone (RPZ)	Existing and Future Runway 9	1,000'	2,500'	1,750'
	Existing and Future Runway 27	1,000'	2,500'	1,750'
	Existing and Future Runway 3	500'	1,700'	1,010'
	Existing and Future Runway 21	500'	1,700'	1,010'
MnDOT Clear Zone	Existing and Future Runway 9	1,000'	2,500'	1,750'
	Existing and Future Runway 27	1,000'	2,500'	1,750'
	Existing and Future Runway 3	500	1,700'	1,010'
	Existing and Future Runway 21	500	1,700'	1,010'

Source: MnDOT Office of Aeronautics: Clear Zone Requirements

5.9.2 Summary of Airport Property Recommendations

Note to Reviewer: This section will be completed following the Exhibit A property research efforts.

5.10 Zoning

Minnesota Administrative Rules, Chapter 8800 requires all licensed airports to have Airport Zoning. There are two parts to the Airport Zoning requirements: Air Space Obstruction Zoning and Land Use Safety Zoning. These are discussed further in the sections that follow.

5.10.1 Minnesota Airport Airspace Obstruction Zoning

Note to reviewer: this section will be updated with the proposed JAZB ordinance currently at MnDOT for review and approval

5.10.2 Minnesota Airport Land Use Safety Zoning

Note to reviewer: this section will be updated with the proposed JAZB ordinance currently at MnDOT for review and approval

5.11 Land Needed for Aeronautical Use

The recommendations for the existing and ultimate conditions in both Chapter 4 and 5 were evaluated to identify land that should be reserved for aeronautical uses. This includes land that is within the airport operations area, land within protected areas (RPZ, RVZ, BRL, etc.) and land within Zone 1 of the proposed Airport Zoning Ordinance. Land that is not needed for aeronautical purposes can be considered for non-aeronautical development in the future. This includes areas that do not have connection to the airfield and are not in areas that should be protected from development to ensure compatible land use with the airport (ie. In the RPZ or Zone 1).

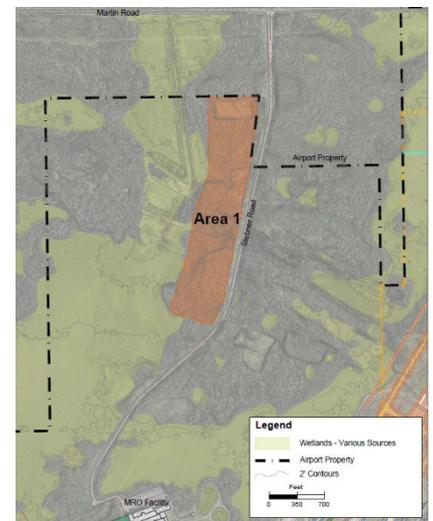
5.12 Non-Aeronautical Development Opportunities

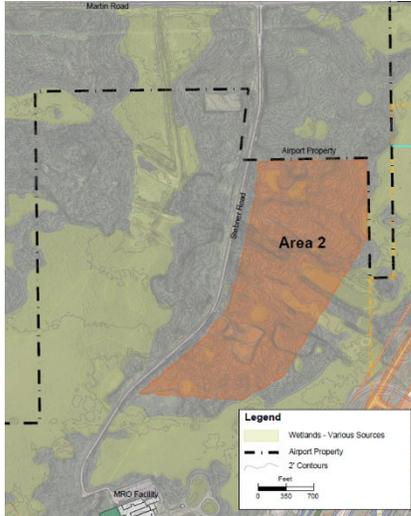
As the airport wishes to grow revenue streams, opportunities for non-aeronautical use may provide new and diversified revenue opportunities. As part of the Master Plan, an Economic Development Technical Advisory Committee met to inform the Master Plan process and how the airport can support economic development, inform the ultimate airport land use, inform future DAA investments, and understand the role DLH plays in the overall regional economy. The TAC influenced the ultimate aeronautical building area development recommendations and provided input on potential non-aeronautical development opportunities.

The TAC identified several types of non-aeronautical development they felt were complementary to the airport. These included: convenience store/gas station, daycare, industrial park uses, and warehousing and storage. The TAC also noted that large sites (50 acres+) are not readily available in the area and would add value if available at the airport.

Five key development areas were identified by the TAC as potentially being suited for non-aeronautical use in the future. The sites include:

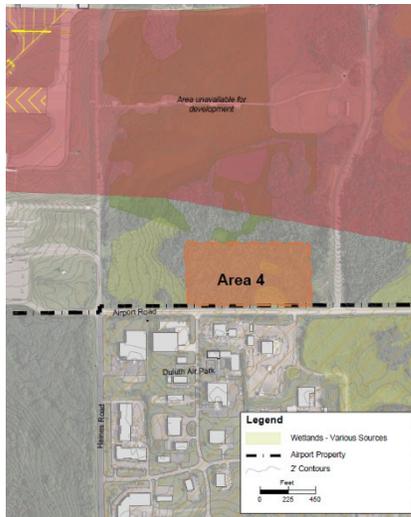
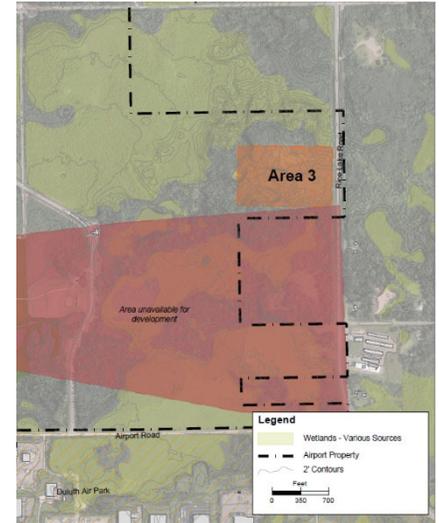
Area 1 – This area is along the west side of Stebner Road, north of the MRO facility and south of Martin Road. This site is approximately 35 acres and located in Canosia Township. It is currently zoned as Commercial (St. Louis County). While the site does have roadway access, there are wetlands and topographic challenges that limit the developable area and may increase construction costs. There are no existing utilities at this site and utility expansion may be challenging as the City of Duluth utilities end at the MRO facility and cannot be extended north into Canosia Township. There are no utilities along Martin Road to the north. Because this land has prior federal investment (land funding), it is expected that a formal FAA land release process will be required prior to any development.





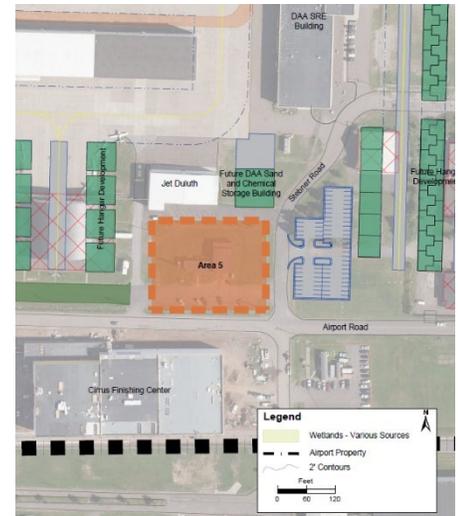
Area 2 – This area is on the east side of Stebner Road, north of the MRO facility and south of Martin Road. This site is approximately 90 acres and located in Canosia Township. It is currently zoned as Commercial (St. Louis County). While the site does have roadway access, there are wetlands and topographic challenges that limit the developable area and may increase construction costs. This site has similar utility challenges as Area 1. Because this land has prior federal investment (land funding), it is expected that a formal FAA land release process will be required prior to any development.

Area 3 – This area is along Rice Lake Road and is currently zoned Mixed-Use Business (City of Duluth). This site is approximately 28 acres and is developable while avoiding wetlands. Utilities are also limited at this site. Because of previous federal investment in the land, it is expected that an FAA Land Release will be needed prior to development.



Area 4 – This area is approximately 10 acres along Airport Road within the City of Duluth. It is currently zoned Rural Residential and would require rezoning as residential is not a compatible land use in this area due to noise impacts. The area has access to utilities along Airport Road including natural gas. Water and sanitary sewer exist in the industrial park across Airport Road. The TAC indicated that this site could be well suited for a gas station development or industrial park uses.

Area 5 – This site is approximately 1 acre located within the southwest quadrant along Airport Road. It is currently home to Hermantown Hydraulics, a non-aeronautical tenant (hydraulic repair business). The DAA owns the existing building. The Building Condition Assessment in **Appendix C** found the building's exterior to be in fair condition, the roof was not accessible during the site visit and was not assessed. This site is prime for redevelopment as the existing use does not maximize the utility of the site. The site does not have access to the airfield; therefore, aeronautical use is not available. However, this site may be well suited for a complementary or aviation related use. For example, this could include a facility for Cirrus that does not require access to the airfield or a new building (non-hangar) for Civil Air Patrol. This site has multiple utilities including natural gas, water and sanitary sewer.



5.13 Roadway Access

Airport access via roadways is described in **Section 2.14.7**. No stakeholders indicated any needs for roadway improvements to accommodate existing or future growth plans at the Airport. However, the importance of adequate roadway networks was identified as a key factor in the success of economic development opportunities on the airport.

The Duluth-Superior Metropolitan Interstate Council (MIC) is the region's designated Metropolitan Planning Organization (MPO) and sets priorities for federal dollars on existing and future transportation projects. The Long-Range Transportation Plan and Transportation Investment Plan developed by the MIC consider transportation needs to move people and products, including to and from the airport. Sustainable Choices 2045, the 2020-2045 update to the MIC's Long Range Transportation Plan, identifies the airport has a key element of the Duluth-Superior Multimodal Transportation Network. As part of this plan which covers all modes of transportation, several roadways surrounding and near the airport were identified for future study.

Currently, the MIC is conducting a Central Entrance Transportation Plan which is developing a new vision for the Central Entrance corridor. The plan will consider how the corridor provides multi-modal access to and from the airport today and in the future.

It is recommended that the airport play an active stakeholder role in future MIC short- and long-term planning efforts.

5.14 Environmental and Sustainability Recommendations

No specific sustainability plan has been developed for the Airport. There can be many benefits of airport sustainability planning, including reduced energy consumption, reduced noise impacts, reduced hazardous and solid waste generation, reduced greenhouse gas emissions, improved water quality, improved community relations, and cost savings. The following discussion focuses on the sustainability recommendations regarding hazardous and solid waste generation.

Under the current facility operations, waste generated by hanger users and airport tenants is looked at as separate from the waste generated in the public-accessed facilities and, as a result, the Airport has little control over the hangar and tenant waste. Under the recommendations outlined below, that control does not change; however, the proposed programs are meant to educate and promote proper waste management methods for all airport users.

The purpose of the proposed recommendations is to ensure waste generated at the airport is managed in compliance with environmental regulations and reduce land disposal of waste as stipulated under Minnesota Statute §115A.02. Given the small amount of waste generated at the facility, the hazardous and solid waste sustainability efforts will probably not represent a cost savings to the airport. Because the quantities of saleable materials generated at DLH is anticipated to be low, it is most cost effective to utilize the convenience of Western Lake Superior Sanitary District (WLSDD) programs to manage recyclable materials. As a result, the hazardous and solid waste sustainability efforts will not generate additional revenue based on recyclable commodities.

5.14.1 Waste Reduction

The Minnesota Waste Management Hierarchy (Minn. Stat. §115A.02) gives highest preference for waste reduction and reuse. Any efforts to reduce waste generation at a facility not only reduces the volume of waste requiring land disposal, but it also reduces the overall volume of waste generated to begin with. Waste reduction is generally recognized by packaging reduction, office paper reduction, composting, and material re-use.

In an on-going effort to reduce waste, three recommendations have been identified that could potentially reduce the amount of waste generated at the Airport. It should be noted that individual tenants are responsible for their own waste management.:

- 1. It is recommended the airport promote the use of multiple use beverage containers for water, coffee, etc. inside the terminal building and with airport employees**
- 2. It is recommended the airport continue the use of electronic media by using electronic mail, website notifications, etc. for tenants, employees and airport board packets.**
- 3. It is recommended that the Airport utilize WLSSD resources to identify potential re-use or proper disposal of site materials and IT equipment. Options should be explored to reduce solid waste generation through logistical changes, purchasing policies, or recycling efforts for any unique waste materials generated routinely or as part of special construction projects.**
- 4. It is recommended that waste management practices be evaluated annually and discussed with the WLSSD Administrator to determine if the waste reduction efforts are adequate, if there have been any regulatory changes, and whether any modifications are necessary.**

5.14.2 Waste Education

Waste education can be the most important way to encourage proper management of hazardous and solid waste. The WLSSD and the MPCA has resources available to residents and businesses to help with waste education through brochures. People who are aware of the impacts that waste can have on the environment are more likely to seek out and use waste abatement programs.

1. It is recommended the Airport obtain and display WLSSD and/or MPCA brochures to promote proper waste management activities and share these practices with airport tenants. Particular efforts should be made in the proper management of maintenance waste including antifreeze, tires, vehicle batteries, oil filters, and used oil. Outreach could occur annually as part of tenant meetings or at other user/tenant events.
2. It is also recommended that the Airport establish site-specific airport waste abatement goals and prepare signage or notifications for airport users to assist the facility in meeting the goals.

5.14.3 Waste Recycling

Recycling in the form of source separation has become the backbone for waste management programs. However, knowledge and convenience remain the driving force behind successful recycling programs. Knowledge in the form of waste education recommendations is presented above in **Section 5.14.2**. Convenience and availability are addressed here. Three recommendations have been identified as part of the planning study.

1. It is recommended the Airport provide easy access, recycling bins on-site for basic recyclable material (newspaper, cardboard, cans, glass, and plastic) in order to promote recycling in areas with highest waste generation (like the Terminal building) and have signage indicating which materials go into which bin
2. It is also recommended to provide a centralized indoor storage area for the storage of problem materials, particularly those banned from land disposal including fluorescent lamps, electronics, appliances, HHW, used motor oil and motor oil filters, tires, lead acid, nickel-cadmium, and vehicle batteries.
3. It is also recommended the Airport assign duties to airport personnel to monitor recycling bins and the problem material storage area and make arrangements, as necessary, to transport materials to appropriate recycling and/or drop-off locations.

Records should be kept on the volume of material transported for recycling and compared to the volume of waste material generated in order to document the amount of waste that has been diverted from land disposal on an annual basis.

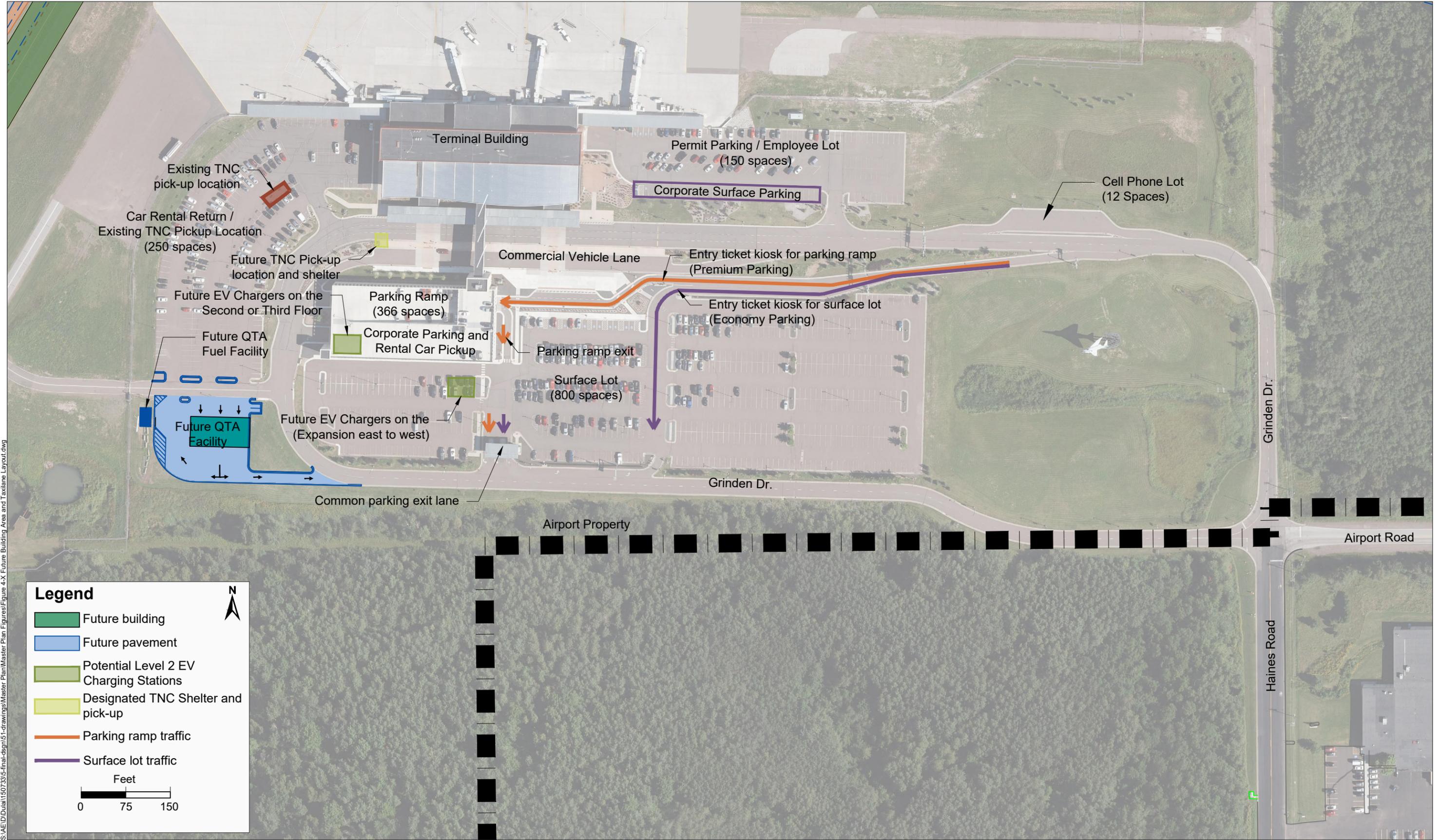
5.14.4 Other Regulated Environmental Activities

Because of the storage of certain materials on-site, the Airport activities fall under environmental regulatory requirements. The United States Environmental Protection Agency (U.S. EPA) has established regulations for oil pollution prevention in the Code of Federal Regulations, Title 40 (40 CFR), Parts 110 through 112. The three primary criteria for facilities requiring an SPCC Plan are as follows:

- The facility must be non-transportation related and engaged in drilling, producing, gathering, storing, processing, refining, transferring, distributing, using, or consuming oil and oil products.
- The facility must have an aggregate aboveground storage capacity greater than 1,320 gallons or below ground storage capacity greater than 42,000 gallons.
- There must be a reasonable expectation that, due to its location, the facility could discharge oil into or upon the navigable waters or adjoining shorelines of the United States.

DLH stores 9 UST fuel tanks four 25,000-gallon Jet-A tanks and one 10,000-gallon 100LL tanks, one 10,000-gallon gasoline tanks and one 10,000 and one 12,000-gallon Diesel tank, approximately 0.51 miles north of Miller Creek. Thus, the facility meets all the primary criteria requiring SPCC Plans.

The DAA has indicated that an SPCC Plan for DLH has been prepared for its Snow Removal Equipment Garage (SRE). Monaco Air is the owner and operator of the FBO tanks and is responsible for preparation of an SPCC. ***An SPCC should be in place for all tanks on the airport to maintain the site's compliance with 40 CFR Parts 110 through 112.***



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